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Influence of E-Ticketing on Service Reliability in the Tanzania Railways Corporation's Passengers Transportation

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Abstract: ***The paper is based on a study that assessed the influence of e-ticketing on service reliability at Tanzania Railways Corporation (TRC). Three predicting variables guided the study as hypotheses tested towards service reliability as the dependent variable. The independent variables as the predictors include dependability, consistency, and trustworthiness. A descriptive design was employed during the study. Knowledge generation was facilitated by testing the relationship between the independent and dependent variables. Sampling involved systematic random procedures where TRC customers were selected at intervals of 3. Primary data were used to facilitate the knowledge generation process using structured questionnaires from 200 respondents among the customers who were beneficiaries of the TRC e-ticketing services. The results were analysed using inferential statistics using the Statistical Package for Social Sciences software version 23. At the same time, the presentation was done using frequency tables and explanations. Therefore, multiple regression analysis was used to facilitate the knowledge generation process. The results indicated that all three predicting variables tested towards the dependent variable, namely dependability, consistency, and trustworthiness, are positive, with significant evident outcomes (at p<0. 05) toward service reliability as the dependent variable. The results imply that e-ticketing measures positively influence service reliability in TRC. The study recommended that it is essential for the Corporation to invest strictly in addressing the challenges associated with e-ticketing services access and provisions for attaining service quality and well-being in initiatives to sustain good practices for customer satisfaction.***

Keywords: ***E-Ticketing, Service Reliability, Dependability, Consistency, and Trustworthiness***

1. Introduction

E-ticketing is essential in facilitating ticket entry, processing, acquisition, and marketing for companies engaged in service provisions such as airlines, railways, entertainment, transport, and others (Fujimura & Nakajima, 2018). E-ticketing is an embedded practice since it has been motivated by technological developments and transformations in different parts of the globe, enabling tasks through the Internet and information systems (Matsuyama & Fujimura, 2019). E-ticketing is a valuable practice in the transport sector in different means of transportation, including roads, air, railways, waterways, and others, as it fosters flexibility in service provision because services are mobile in accessing them and also permission to enter on board since may be accessed and displayed using mobile devices such as smartphones (Long, 2021).

2. Empirical Literature Review

Also, e-ticketing ensures the reliability of the services as they are available at all times, and one may access the services regardless of location, time, or place since the information system effectively fosters service provision (Wills, 2020). Additionally, with e-ticketing, information security is guaranteed that it is helpful for both customers and the organization as the service provider(s). This is the case because e-ticketing services utilize always available information, while e-ticketing customers are assured of never encountering financial loss when accessing the tickets (Carls, 2022). In that case, e-ticketing is deemed helpful in assuring customer satisfaction due to the ease of accessing the services and other comfort gains associated with the services. Also, e-ticketing has been applied in several countries, especially in different transportation means, including railway transport services (Stone, 2021). This has been the practice in countries such as the United States of America (USA) since 1994 in the airline and advanced to several other forms of transport, including railways, road transportation, taxis, and others (Long, 2021). The same practice has been in Canada, the United Kingdom (UK), Scotland, Japan, South Korea, and Singapore. This made e-ticketing compulsory in 2008 in some countries in the developed world, including airlines, buses, taxis, railway transportation, ferries, and others applicable today (Long, 2021).

The tickets may be ordered online and printed at the station's ticket counter, and the passenger may board and go. Also, the ticket may be held on a mobile device such as a smartphone or tablet and shown to the conductor using the mobile app (Jackson, 2021). Therefore, e-ticketing has been a good and helpful practice in modern state systems in facilitating transportation services, including in the railway sector. This is the practice in the developed states in most accounts and in some very few or minute developing countries due to the inability to invest appropriately in the venture (Jackson, 2021). Tanzania, in particular, constitutes an active railway transport system that provides railway transport services to the public (Skinner, 2019). It is led by a public, state-owned enterprise known as the Tanzania Railways Corporation (TRC). The Corporation runs two main railway lines: the central line from Dar es Salaam to Kigoma, Mpanda and Mwanza and the northern line from Dar es Salaam to Tanga and Arusha (Arai, 2022). The Corporation, which is the monopoly in service provision, has recently, in 2021-2022, introduced an e-ticketing system to facilitate service quality in accessing services to attain customer satisfaction (Arai, 2022).

This is the case because, with e-ticketing, the level of mobility in accessing services has been high due to flexibility (Long, 2021). Also, the services are reliable and mobile, with information security regarding online bookings and transactions. Since the entity's target has been to attain customer satisfaction, the e-ticketing system has severe shortcomings, including limited network access that keeps persisting (Willis, 2020). This tends to affect service availability to the customers, which constitutes effects as well towards customer satisfaction in providing the services. Despite that, the website tends to be unavailable from time to time, affecting the level of satisfaction of the customers as beneficiaries of accessing the services. This, therefore, brings about the concern of undertaking the study towards the e-ticketing measures and customer satisfaction in railway transportation since recent development is essential to determine the outcome that is useful for the way forward measures towards service quality attainment.

3. Statement of the Problem

E-ticketing in railway transport services in Tanzania has helped facilitate service quality due to increased flexibility, information security, and reliability of services (Arai, 2022). However, the reality is that the availability of the services has faced challenges of network availability and consistency, which has been a setback towards the realization of customer satisfaction (Ibid). The persisting situation fosters the need to undertake the study to address the concern since the recent phenomenon needs to be further envisaged. In that case, several studies have been conducted in the railway sector and services on various concerns, including organization merging and employee satisfaction (Salehe, 2021), railway services and industrial sector development (Mroki, 2021), power supply and efficiency towards modern railway system (Lupala, 2022). However, all studies further recommended the need to envisage further e-ticketing measures on customer satisfaction since it is a recent phenomenon. This implies that few studies have been conducted in the area, which is the gap that needs to be filled. The study is therefore conducted to assess the role of e-ticketing on customer satisfaction in railway transport in Tanzania.

The model describes the study assessing the role of e-ticketing on service reliability in Tanzania Railways Corporation (TRC). The study is guided by the key assumption or premise that e-ticketing measures positively influence service reliability in the TRC. Since that is the case, three hypotheses have been derived and tested and are described as follows.

The paper attempted to examine the influence of e-ticketing on service delivery in the Tanzania Railway Corporation's mode of transport. It was conceptually thought that E-ticketing has an influence on the multiple variables of TRC service delivery, including service reliability, consistency and trustworthiness of the model of transport. This, therefore, leads to the following hypothesis.

H1: Tanzania Railway Corporation has a positive relationship with e-ticketing and service reliability.

H2: The Tanzania Railways Corporation (TRC) has a positive relationship with e-ticketing and service flexibility.

H3: The Tanzania Railways Corporation (TRC) has a positive relationship with e-ticketing and information security.

4. Methodology

The study was conducted in Dar es Salaam city among customers using railway transport services, specifically at the Tanzania Railways Corporation (TRC) premises, which accommodates travellers and arrivals. The area was selected because it is essential to gather as many customers as possible and ensure successful information gathering for the study. The study used an explanatory study design because the facts to fill the gap were obtained through a causal relationship approach, which tests the relationship between study variables. This is the perception of the research undertaking (Creswell, 2012). The study was centered on positivist philosophy because it was objective, with the knowledge obtained using a structured instrument such as the questionnaire and reality being grouped into study hypotheses. The study employed a quantitative approach since it was objectively undertaken, and knowledge was generated through the what, when, and where regarding the phenomenon under study. This is the case since Denzin and Lincoln (2005) suggest that the quantitative approach intends to envisage the what, when, and where of the phenomenon under study. The study used primary data to facilitate the knowledge-generation process. Secondary information was also used as supporting information to fill the knowledge gap. These were collected through articles online and analysed by content analysis. In addition, secondary information complements primary data when discussing the findings. The study comprised customers who use train services for transport facilities in various destinations in the country on the two routes. Since the population was finite, so the sample size was generated from total number of passengers in the last financial year July, 2023 to June, 2024. This was 200,000 passengers obtained from the Dar es Salaam Railway Station by summation of trips of travel annually. Since that is the case, the population is considered infinite since customers usig the railway transport services are several, and their number as the population cannot be determined at its exact figure. In the process, some customers get access to the services, while others may fail to get access. Therefore, the number was determined by the assumed mean or number for the sample size being justified.

This section comprised different categories based on the sampling pattern, such as the unit of inquiry, sample size, and sample selection techniques. Since customers using train services as a mode of transport were participants in the study, the unit of analysis was individuals, specifically customers in the respective area selected for the study. The study sample size was selected in the study area through a simple random sampling technique because many respondents in the established facilities could provide the services and reliable data to fill the study gap.

The study consisted of the customers because they were the participants who helped generate the facts to fill the knowledge gap. They comprised 200 participants among customers. The sample size was generated using the formula described by Webb (1991);

$$n = \frac{N}{1+N(e^2)}$$

N = Population 200000
e = Level of precision (sampling error) 10 per cent or 0.1

$$n = 200000/1+200000(0.1^2)$$
$$n = 200000/1+4660.49$$
$$n = 200000/4661.49$$
$$n = 199.98$$

n = Sample Size = approximately to 200

The study facts collected from the field were quantitatively grouped in the Statistical Package for Social Science, a tool for quantitative data analysis version 23.0. In contrast, significant statistical measurements were tested to generate sufficient measurements to present the primary information and ensure knowledge gap filling. Since that is the case, descriptive statistics were produced to describe the characteristics of the respondents. In addition, correlation and multiple regression analysis were also performed to show the causal relationship testing and ensure knowledge gap filling. Therefore, the study was guided by the model that;

$$CS = \beta o + \beta 1SF + \beta 2SR + \beta 3IS + e$$

Where by

CS = Customer Satisfaction

βo = Constant Factor

$\beta 1SF$ = Service Flexibility

$\beta 2SR$ = Service Reliability

$\beta 3IS$ = Information Security

e = Random Variable

Validity and reliability of data quality measurements were performed in the study. Validity was first performed to generate accuracy on the study variables and ensure validation of the data collection instrument, the questionnaire. This was performed through pre-testing of the questionnaire. Reliability was conducted after data collection and computation, and it was performed to ensure consistency on the study variables through Cronbach Alpha test measurements. Therefore, the results are described in Table 1 below.

Table 1 Cronbach Alpha Test

Paper Variable	Cronbach's Alpha
Service Reliability	0.794

The assertion is acknowledged by Creswell (2012), stating that in the reliability test, the coefficients reach 0.7, and more automatically, the variables under study become reliable and consistent, which is the outcome of the tested variables, both predictors and the dependent variable.

5. Findings and Discussion

This section describes the study's results. For causal relationship testing, multiple regression analysis was used to describe the existing relationship between the predictors and the dependent variable. Therefore, Table 2 illustrates the following results.

Table 2 Multiple Regression Analysis

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.597	.194		3.071	.002		
Dependability	.263	.090	.200	2.918	.004	.793	1.261
Consistency	.257	.077	.245	3.335	.001	.688	1.452
Trustworthiness	.304	.075	.295	4.072	.000	.706	1.416

a. Dependent Variable: Services Reliability

5.1 Dependability

The results indicate that there is a positive relationship between dependability and service reliability (at $p<0.05$) in the TRC model of transport through E-ticketing. This implies that E-ticketing has an intermediate influence on enabling the delivery of TRC services in the study area. This statement is in line with Arai (2022), stating that e-ticketing initiatives by the Railway Corporation in Tanzania indeed are an achievement in the service provision and the government's initiatives towards automation of tasks. Since that is the case, the situation has fostered transformation in service delivery since e-ticketing highly depends on customers accessing the corporations' services. Though challenges are there in networks as time passes, the discrepancies may still be dealt with and successfully sorted progressively. These results are linked to the SERVQUAL MODEL of service delivery that presses the

importance of reliability, assurance, empathy, tangibility and responsiveness of services that TRC is achieving through E-ticketing practices.

5.2 Consistency

The results indicates that the TRC services are consistent (at $p<0.05$). This implies that the services delivered by TRC are mediated by E-Ticketing practice that results into consistent use by customers. This is an indication of realized customer satisfaction of service delivery. These results are linked to Jackson (2021) who suggests that e-ticketing helps access services, including transport services, since it is dependable, consistent, and trustworthy due to its mobility and accessibility. This automatically assures a high level of reliability and assurance in service delivery and access that may foster the realization of the well-being of the initiatives in the process. This is the reality that is certain in several jurisdictions. The initiatives exist both in developed and developing countries.

5.3 Trustworthiness

The results indicate that all three predicting variables tested towards the dependent variable, namely trustworthiness, are positive, with significant outcomes towards service reliability as the dependent variable ($p<0.05$). The results imply that e-ticketing measures positively influence service reliability in Tanzania Railways Corporation (TRC) through e-ticketing. The outcome of the collinearity statistics reveals that the variance inflation factor (VIF) values are less than 5, implying that the variables have no Multicollinearity problem. The results are in line with the definition of customer satisfaction, which refers to the assessment or measure in the market regarding how the product or service supplied by the company or business meets or surpasses customer expectations (Deighton, 2022). This generates trustworthiness among customers to the services, which in turn promotes the sustainability of the business.

6. Conclusion and Recommendations

Service reliability is essential in the Tanzania Railways Corporation (TRC), and with e-ticketing, a great deal of success has been realised through consistency, dependability, and trustworthiness. Regardless, the existing and persisting challenges about network issues and well-being in service delivery have had implications for the organisation's performance. However, the shortcomings must be addressed to ensure prosperity in the process and practices.

Since the reality about the service's reliability is optimistic and confident regarding e-ticketing, it is recommended that the TRC determines all network defects and other shortcomings and strictly addresses them to combat them. This is important and necessary because the issues affecting service reliability are the challenges associated with e-ticketing service access and delivery. They are within the capability of the Corporation to put an end to them completely.

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